

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

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|--|---|--|
| Applicant's or agent's file reference CFO17652WO | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/JP 03/13530 | International filing date (day/month/year) 23/10/2003 | (Earliest) Priority Date (day/month/year) 24/10/2002 |
| Applicant CANON KABUSHIKI KAISHA | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the title,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the abstract,

☐ the text is approved as submitted by the applicant.

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

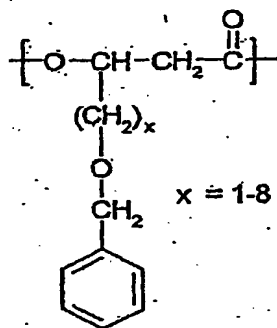
☐ because this figure better characterizes the invention.

☒ None of the figures.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Provided are a PHA having an active group, which is produced by microorganisms with high productivity, and in which the ratio of units on its side chain having an active group can be controlled and the physical properties can be arbitrarily controlled so that its application as a polymer is not limited, and a method for producing the same.

PH comprising a 3-hydroxy- ω -[(phenylmethyl)oxy]alkanoic acid unit expressed by the following chemical formula (1):



wherein x can be one or more integers within the range shown in the chemical formula is provided.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 03/13530

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C08G63/06 C12P7/62

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C08G C12P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| P, X | EP 1 340 776 A (CANON KK) 3 September 2003 (2003-09-03) paragraphs '0023!-'0031!; claims 2,11; example 22 | 1-20 |
| A | EP 1 130 042 A (CANON KK) 5 September 2001 (2001-09-05) the whole document | 1-20 |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

15 January 2004

Date of mailing of the international search report

23/01/2004

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Authorized officer

Masson, P

INTERNATIONAL SEARCH REPORT

International Application No
PCT/JP 03/13530

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| A | KIM O ET AL: "BIOENGINEERING OF POLY(BETA-HYDROXYALKANOATES) FOR ADVANCED MATERIAL APPLICATIONS: INCORPORATION OF CYANO AND NITROPHENOXY SIDECHAIN SUBSTITUENTS" CANADIAN JOURNAL OF MICROBIOLOGY, OTTAWA, CA, vol. 41, no. SUPPL 1, 1995, pages 32-43, XP000985628 ISSN: 0008-4166 cited in the application the whole document | 1-20 |
| A | TAKAGI Y ET AL: "BIOSYNTHESIS OF POLYHYDROXYALKANOATE WITH A THIOPHENOXY SIDE GROUP OBTAINED FROM PSEUDOMONAS PUTIDA" MACROMOLECULES, AMERICAN CHEMICAL SOCIETY, EASTON, PA, US, vol. 32, no. 25, 1999, pages 8315-8318, XP001113020 ISSN: 0024-9297 the whole document | 1-20 |
| A | EP 1 236 752 A (CANON KK) 4 September 2002 (2002-09-04) paragraphs '0023!-'0027!; claims; examples | 1-20 |
| A | EP 1 118 629 A (CANON KK) 25 July 2001 (2001-07-25) paragraphs '0033!-'0035!; claims; examples | 1-20 |
| A | EP 1 236 754 A (CANON KK) 4 September 2002 (2002-09-04) paragraphs '0008!-'0016!; claims; examples | 1-20 |
| A | EP 1 188 782 A (CANON KK) 20 March 2002 (2002-03-20) paragraphs '0053!-'0061!; claims; examples | 1-20 |
| A | EP 1 113 033 A (CANON KK) 4 July 2001 (2001-07-04) paragraphs '0034!-'0046!; claims; examples | 1-20 |
| | -/-- | |

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
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| A | STEINBUECHEL A ET AL: "DIVERSITY OF BACTERIAL POLYHYDROXYALKANOIC ACIDS" FEMS MICROBIOLOGY LETTERS, AMSTERDAM, NL, vol. 128, no. 3, 15 May 1995 (1995-05-15), pages 219-228, XP000828495 ISSN: 0378-1097 page 222 -page 223; figure 2 --- | 1-20 |
| A | EP 1 236 755 A (CANON KK) 4 September 2002 (2002-09-04) paragraphs '0048!-'0066!; claims; examples --- | 1-20 |
| A | GROSS R A ET AL: "CYANOPHENOXY-CONTAINING MICROBIAL POLYESTERS: STRUCTURAL ANALYSIS, THERMAL PROPERTIES, SECOND HARMONIC GENERATION AND IN-VIVO BIODEGRADABILITY" POLYMER INTERNATIONAL, BARKING, GB, vol. 39, no. 3, March 1996 (1996-03), pages 205-213, XP009009769 the whole document --- | 1-20 |
| A | AROSTEGUI S M ET AL: "BACTERIAL POLYESTERS PRODUCED BY PSEUDOMONAS OLEOVORANS CONTAINING NITROPHENYL GROUPS" MACROMOLECULES, AMERICAN CHEMICAL SOCIETY. EASTON, US, vol. 32, no. 9, 4 May 1999 (1999-05-04), pages 2889-2895, XP000824220 ISSN: 0024-9297 the whole document ----- | 1-20 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JP 03/13530

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|--|--|
| EP 1340776 | A | 03-09-2003 | JP 2003319792 A CN 1440992 A EP 1340776 A1 US 2003208028 A1 | 11-11-2003 10-09-2003 03-09-2003 06-11-2003 |
| EP 1130042 | A | 05-09-2001 | EP 1130042 A2 JP 2002173521 A US 2003100084 A1 | 05-09-2001 21-06-2002 29-05-2003 |
| EP 1236752 | A | 04-09-2002 | JP 2002327048 A EP 1236752 A2 US 2003059907 A1 | 15-11-2002 04-09-2002 27-03-2003 |
| EP 1118629 | A | 25-07-2001 | JP 2001288256 A CN 1322768 A EP 1118629 A2 US 2003180899 A1 US 2001029039 A1 | 16-10-2001 21-11-2001 25-07-2001 25-09-2003 11-10-2001 |
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| EP 1188782 | A | 20-03-2002 | JP 2002241476 A JP 2003047494 A EP 1188782 A2 US 2002160467 A1 | 28-08-2002 18-02-2003 20-03-2002 31-10-2002 |
| EP 1113033 | A | 04-07-2001 | JP 2002080571 A CN 1321695 A EP 1113033 A2 US 2003208029 A1 US 2002022253 A1 | 19-03-2002 14-11-2001 04-07-2001 06-11-2003 21-02-2002 |
| EP 1236755 | A | 04-09-2002 | EP 1236755 A2 JP 2003306534 A US 2003013841 A1 | 04-09-2002 31-10-2003 16-01-2003 |